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PROFESSOR TITCHENER ON THE THOUGHT PROCESSES.¹

In these lectures Professor Titchener clearly distinguishes two questions often confused: (1) Does imageless thought occur? (2) Is there an elemental kind of consciousness, neither sensational nor affective, which distinguishes thought? In my opinion, he argues decisively against the occurrence of imageless thought. On the one hand he successfully criticises the experimental arguments for imageless thought, showing that they are inconclusive; and, on the other hand, he shows by the brilliant analysis and description (Lecture I.) of his own thought-process what unsuspected richness of imagery may be included in thought. One outcome of the specific discussions of 'meaning' (pp. 104, 174 ff., *et al.*), of 'attitude' (pp. 101 ff., *et al.*), and of '*Aufgabe*' (pp. 120 ff., 175 ff., *et al.*) is, thus, a demonstration that all three include imagery.

Professor Titchener, however, goes further and denies the occurrence of elemental 'relational' (or 'thought') elements of consciousness. Here I believe that he is mistaken and I shall therefore consider his argument in more detail:

I. In the first place, Titchener urges, the experimental arguments furnish no final proof of the occurrence of a *sui generis* relational consciousness. To this conclusion, stated so generally, I am quite ready to subscribe. But decisive proof is hardly to be expected from any one experimental study of such a problem. In the nature of the case the experiments can do little more than simplify the problem, by good experimental conditions, and check introspection by repetition and control. Such experiments are no more than systematically and partially controlled introspection. They cannot be judged by the standards of experiments with variable sense-stimuli.

¹ *Lectures on the Experimental Psychology of the Thought Processes.* E. B. Titchener. New York, The Macmillan Co., 1909.

Furthermore, most of the experimental investigations under discussion were either too broad in scope to deal conclusively with the crucial question (the occurrence of elemental relational consciousness) or else their main interest lay elsewhere. Thus, Binet (p. 82²) undertakes to "carry investigation into the higher mental phenomena, such as memory, attention, imagination . . ." and Messer beginning with experiments in free association is "led from experiment to experiment by the suggestion of his own results" (p. 89). On the other hand, Marbe studies judgment exclusively, whereas Ach (p. 86) is "concerned primarily with . . . voluntary action" and only secondarily with thought; and Watt and Messer start with the study of association.

The feature common to all these experiments with those which Bühler planned more definitely to test the thought-element problem, is the fact that the purpose of them all is to secure full and correct introspection. And the result on which, I think, Titchener lays too little stress is that all these experimenters, each with his different outlook, concur in the view that our consciousness contains experiences other than sensational and affective. One may even agree with Titchener that no one of these experiments, taken by itself, excludes the possibility of introspection wrongly read, and one will yet find it probable that the cumulative outcome of the experiments tells strongly for the relational-element theory. In particular, I think that, so far as Bühler's experiments are concerned, it is more reasonable to accept at its face value the introspection of so trained an observer as Professor Külpe, one of Bühler's chief subjects, than to acquiesce in Titchener's view (p. 146) that Külpe confused his thought and its object, and described the latter not the former. Titchener notes as a point in his favor (p. 150) the fact that Dr. Dürr, another of Bühler's subjects, has recently criticized the experiments on the ground that they call for 'verbal expression' rather than for 'psychological description.'¹ Dürr's criticism, however, tells against the imageless-thought rather than against the relational-element conception. Indeed he expressly avows the belief that a *Beziehungsbewusstsein*, or consciousness of relation, is a non-sensational constituent of the *Vorstellungsl Leben* (*Zeitschr.*, XLIX., p. 326); and he defends Bühler against Wundt's criticism (*ibid.*, pp. 329 ff.).

II. The most serious of the criticisms made by Titchener on the relational-consciousness theory is the following: The advocate of the occurrence of relational elements is confusing the object of the psy-

¹ *Zeitschrift für Psychol.*, 1908, XLIX., pp. 315 ff.

chologist — feeling, psychosis, mental process — with the object, or thing, of common sense; he points out like objects but does not thereby prove the existence of a feeling of likeness; he tells us (p. 151) "not what consciousness is but what it is about." In the case of the relational consciousness, this amounts to a confusion of logic with psychology, since the objects of thought are relations, not concrete things. But Titchener urges (p. 255), "if we are to classify mental processes as feelings 'of' anything, we can multiply our elements *ad infinitum*. . . . The psychical datum is the feeling itself."

To this criticism the following reply may be made: In their efforts to analyze thought, psychologists certainly are sometimes guilty of the 'object-error.' I agree with Titchener (p. 69) that Witasek, for example, too uncritically follows logical classifications in his enumeration of relational elements. But the psychologist is also prone to make the parallel 'stimulus-error,' confusing the stimulus — ether waves or air vibrations — with the elemental feeling due to the stimulus; and we do not therefore forbid him to distinguish sensations from each other by referring each to its appropriate stimulus. We even permit a reference to everyday objects in the discussion of sensation. For example, Titchener himself (on page 59 of *A Text Book in Psychology*, I., 1909) writes thus of the "linear series extending from white through the lighter, neutral and darker greys to black. Language has very few words to denote the qualities of this series. We speak of black, for instance, as if it were a single quality. But glance in succession at black card-board, black cloth, black velvet, and the black of a comparatively lightless space, say the blackened interior of a long pasteboard tube. . . . You realize at once . . . that . . . these four blacks are qualitatively different." Titchener is here, quite justifiably, pointing to everyday objects that he may thereby make his readers realize elemental differences which, as elemental, can not be further analyzed. He can hardly, however, deny to the upholder of relational consciousness who, in the nature of the case, can not refer the relational elements to specific physical stimuli, the right of pointing out groups of objects such that the consciousness of them will bring to attentive observation the relational elements.

III. To my view¹ that the non-sensational (whether 'relational' or 'attributive') element is always realized as 'belonging to' some other element (or complex of elements), or else to two elements or complexes, Professor Titchener objects (p. 187) on the ground that, so, the non-sensational element would come to consciousness as a com-

¹ Cf. *An Introduction to Psychology*, chapters 9 and 10; *A First Book in Psychology*, 1910, pp. 330 ff. et al.

plex, "not as an element at all" (p. 302¹). This criticism seems to overlook my express teaching that the character of 'belonging to' other elements is no part of the relational element but a reflectively attributed character. That which is 'irreducible, unanalyzable' — to quote the terms which Titchener rightly applies (p. 170) to the mental element — certainly cannot be described by being further analyzed; and yet as Titchener also teaches (p. 257) "the exhibition of psychoses, their analysis, the discovery and formulation of their laws of connection, all this is precisely the business of psychology." But psychology cannot carry on this business so far as mental elements are concerned, unless it be allowed to reflect on them, and to classify them both by reflectively (not immediately) observed relations and by reference to physical stimuli or to common sense objects. There need be no confusion of the different points of view.

IV. It is unnecessary to consider at length Titchener's inability to find in his own experience relational elements, for he himself points out (pp. 22 ff., 187 *et al.*) that the divergence, on this point, of introspectors may be due to individual differences. The vividness of Titchener's imagery, in particular of his visual and organic imagery, makes it altogether probable that relational experiences (supposing them to exist) would be but pale and evanescent flecks upon his marginal consciousness.

Professor Titchener supplements his criticism by what he calls (p. 187²) a 'sensationalistic reading of the relational consciousness.' "What," he asks (p. 185¹), "do we experience when we have a 'feeling of relation'?" And he answers: "What I myself experience depends upon circumstances. It was my pleasure and duty, a little while ago, to sit on the platform behind a somewhat emphatic lecturer, who made great use of the monosyllable 'but.' My 'feeling of but' has contained, ever since, a flashing picture of a bald crown, with a fringe of hair below, and a massive black shoulder, the whole passing swiftly down the visual field from northwest to southeast. . . . In this particular instance, the picture is combined with an emphatic attitude; and all such 'feelings' — feelings of if, and why, and nevertheless, and therefore — normally take the form in my experience of motor empathy."

Against this view of the relational element the following objection seems to me to tell heavily: The words 'but,' 'if,' 'like' and the rest must stand for relatively distinct and definite experiences, else we should never understand each other in the use of them — or rather, there would be no such words. But by Titchener's express statement,

the image part of his feeling of 'but,' 'if' and the like varies with circumstances — and, it would follow, with individuals. What was his feeling of 'but' before it became 'a flashing picture' plus an emphatic attitude? And what of people who have never heard a bald-headed lecturer emphasize the word 'but'? It should perhaps be inferred that their 'feeling of but' contains an 'emphatic attitude'; but this attitude is not described. Opponents of the relational theory should, however, be able to describe certain definite images, or types of images, which correspond to such words as 'like,' 'if' and 'but,' in the experience of thinking people, somewhat as the words 'red,' 'apple,' 'joy' stand for similar experiences, or types of experience, in the consciousness of the different people who use them.

I have been chiefly concerned to discuss Titchener's own doctrine, but I cannot forbear to express the thanks which every reader must feel for his masterly summaries of the recent literature, analytic and experimental, of the thought-processes. The effort to equate the varying terminology of Ach, Meyer and Orth, Messer, and the rest, is of real value though not completely carried through. An adequate 'harmony' of these different terminologies is very much needed and demands, in my view, not only a great care to distinguish psychical from bodily attitude but, in particular, these three factors: first, the recognition that meaning, attitude, *Bewusstsein*, *Bewusstseinslage* and the rest reduce to relations of which they are special forms, temporal and untemporal; second, the distinction of what I have elsewhere called unsensual *attributive* from unsensual *relational* elements; and third, a care to differentiate 'relation' and 'related term' from 'consciousness of relation.' Titchener's discussion of meaning (pp. 174 ff.) seems to me to disregard this last named distinction. In making 'meaning' virtually synonymous with association, or associated experience ('context'), he hardly touches on the problem of the nature of the *consciousness* of meaning.

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PSYCHOLOGICAL LITERATURE.

DEVELOPMENT OF RELIGION.

The Development of Religion; a Study in Anthropology and Social Psychology. IRVING KING. New York: Macmillan, 1910. Pp. 371.

This book is, without a doubt, one of the important books of the past twenty years on the early development of societies and, in particular, of religion. Its most striking feature is the exclusion of the idea of personal powers — spirits, ghosts, gods — from any necessary part in the establishment of the *original* religious practices, to the exaltation of the rôle played by chance, impulse and automatic activity.

The principles applied in this book belong in the main to the trend, or trends, called voluntarism, functionalism and instrumentalism. Unless they are clearly understood, the book can but remain unintelligible. Instinctive and impulsive actions are, we are told, more primitive than consciously directed actions. "That is, mental processes are in some way differentiations out of previous overt activities, as well as the cause of some kind of subsequent activity" (pp. 39-40). Applied to primitive religious practices, this statement means that instead of being the product of ideas and feelings, they are the outcome of a relatively unconscious development, and the cause of that form of consciousness distinctive of religious life.

But what is it King calls religion? In defining it, he does not make use of belief in superhuman, invisible, agents, be they ghosts, spirits or impersonal powers. "The idea of God, or deity, is certainly not universal," he tells us. "The common element, if there is one, must rather be sought . . . in some sort of attitude or disposition. . . . An examination of all religions, whether of savage or of civilized peoples, reveals in them all an appreciated attitude towards some sort of values (p. 32)." Of course, all values are not religious, and so an essential part of the problem of the origin of religion will be to determine the circumstances under which the religious attitude has been differentiated from those other conscious states which may also be described as valutional.

Chapter 3 provides an answer to the question, "How does the sense of value arise?" The psychological principle called into service here is the one used to such substantial advantage by John Dewey: the

differentiation and elaboration of consciousness is a function of the resistance encountered by the individual. "The delay in reaching the end, and the consequent appearance of various consequent activities are the elementary conditions which make a consciousness of value possible" (p. 45). Four ways are mentioned by which complications of practices, and therefore, increase of clearness of valuation, may take place (pp. 48-59). The point of chief interest here is that this complication of practices need not be the outcome of a clear purpose, nor involve the presence of those ideas which later are found connected with them; it is, on the contrary, usually the product of mere impulses and chance. Thus, for instance, a purely accidental thing done during a hunt might be repeated through unconscious suggestion. If the hunt were successful, this particular act might be regarded as one of the causes of success. Or, when the satisfaction of an impulse is delayed—for instance, the fighting of an enemy—it might work itself out blindly upon some object belonging to the person, or upon something which at that moment is impulsively made to stand for the hated person. The play-impulse is also instrumental, both in the origin and in the continuance of many customs and ceremonials and, therefore, of a deepening of certain forms of the valuating consciousness. Thus, in these various ways, magical and religious practices have their beginnings.

So far the author has tried to account for the development of values in general. In chapter 4 he undertakes to show how the special values characteristic of religion are produced, or differentiated.

But before we may proceed, the previous question must be answered, "What is the valuational attitude characteristic of religion?" King answers that the religious values are the 'stable,' the 'permanent,' the 'highest,' the 'universal' values. This he does not attempt to establish; it is his fundamental assumption. What he does, however, is to try to show that "the primitive man's highest conceptions of worth are distinctly social matters and hence must be the product of social activities, particularly of those which cluster about the problems and crises which affect the group as a whole" (p. 67). The social organism is the universe of the primitive man. He incorporates within it everything of importance to his own and his fellow's welfare. Therefore the values connected with the community to which he belongs are to him absolute, ultimate, universal.

Our author endeavors to show in this chapter and in chapter 7 that as a matter of fact religion, as he understands it, is a function of the social organization; that it progresses *pari passu* with the solidification of the community.

In the chapter on the Origin of Religious Practices and Ceremonies (pp. 88-133), he develops and illustrates abundantly and interestingly the intimate relation already affirmed between social and religious practices.

King adds his name to the list already long of the recent authors who insist upon going back of the Tylorian Animism to the simpler conception of a non-personal power. Chapter 6 is a valuable discussion of this topic.

In chapter 7, we have an attempt to make clearer the essential nature of religion by contrasting it with magic. In our opinion, he fails signally of his purpose for the reason that he has refused to avail himself of the only natural and definite means of differentiating them from each other, *i. e.*, the specific kind of powers involved in each.

He rejects, as I have done, Frazer's derivation of religion from magic. They are 'diverse growths' and, both, 'more or less automatic results of the psychophysical mechanism.' But magic is individualistic and more or less private. In this respect, "it is opposed fundamentally to the methods and interests of religion which are social and public" (p. 195). The point he wishes to make is "not that religion is essentially social and magic essentially individual, but that the former develops most readily in the atmosphere of the group and that the latter is relatively an individualistic affair" (p. 202). Thus, the line between magic and religion remains very vaguely drawn. It seems, in fact, to be a matter of degree and not of kind. He writes, for instance, "when rites of magic are appropriated by the tribe for public use, they begin to partake of the nature of religion" (p. 193). And, "on the other hand, when religion become subservient to anti-social or to merely private ends, it is scarcely to be distinguished from sorcery" (p. 195).

With regard to deities, we learn that they are symbols more or less personal in form, of values which have arisen in the experience of some individual person or people (p. 261).

Of the last chapters, *Monotheism and the Ethical Conception of the Deity*, *Religion and Morals* (chiefly concerning the Australians), *Religion and the Pathological*, and finally, *Religious Valuation and Supernaturalism*, there is not space to speak. Their substance follows logically from the principles upon which the book is based and their conclusions are in agreement with recent pragmatic philosophy.

A reader not familiar with the latest currents in psychology and sociology would, I imagine, find this book surprisingly new. The psychologist will see in it a systematic, thorough-going, and, I am tempted

to say, almost obstinate application, to the problem of the origin of religion, of principles now much in evidence in the seminal writings of the functionalists or instrumentalists. The author's firm grasp of these powerful principles will not be gainsaid, nor his acumen in detecting their workings at the origin of human societies. For this important service he will receive deserved praise.

The defects of the book arise from what I consider to be a too exclusive interest in the said principles and the consequent inability to recognize, or to correctly appraise, other influences than the ones he wishes to demonstrate. This weakness appears chiefly to my mind in the extremely subordinate rôle he ascribes to naive philosophizing. Primitive men are treated too much as if they had not risen to the intellectual level which, in my opinion, marks the difference between men and animals.

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PRAGMATISM.

Der Pragmatismus. GÜNTHER JACOBY. Leipzig, 1909. Pp. 57.

Time was when for philosophy, as most other things, western civilization went to school to Germany. And indeed we may still go there with great profit. But it is obvious, to most *Ausländer* at any rate, that Germany has not the monopoly of scientific stimulus and initiative she once had. Not that Germany is less productive than then, but that the rest of the western world has become much more so, even as a result of the German tutorship.

But schoolmistress-like it has been difficult for Germany to realize that her one-time protégés have grown up to independent productive capacity. In the natural sciences where results count more quickly in industrial and social life, this recognition has been forced more rapidly than in the more speculative field of philosophy; hence the provincial character of much German philosophical literature.

However, there are signs that even in philosophy Germany is beginning to sit up and take notice of what is going on elsewhere. Among these signs may be reckoned this well-written and suggestive brochure, by Dr. Jacoby. The author frankly confesses at the outset that the pragmatic movement which has been the central issue in England, America, France and Italy for the past ten years, has had very little attention in Germany.

Dr. Jacoby's conception of the movement is a broad one. Its essence he finds in its adoption of the standpoint and method of science

as the standpoint and method of philosophy. The controversies over truth, pluralism, humanism, 'die Religionsphilosophie von James,' are all 'Beiwerke.' At the outset the discussion of 'truth' is characterized as a 'Wortstreit.' But further on it seems to get more significance in relation to the essential nature of the movement.

This 'Wortstreit' the author thinks is due to a confusion of the nature with the function and value of truth. The nature of truth consists in correspondence between ideas and facts. The nature of truth looks backward but its function and value look forward. This latter is 'der springende Punkt' for pragmatists. The real issue is, not what is truth, but what is its function and value in experience? The insistence on the mediating, instrumental character of the function of knowledge is the contribution of pragmatism. In science this process of mediation becomes very extensive and complex, so extensive and complex that it often loses sight of its own character. But it must recover this standpoint, else science is without a rudder.

Some readers are pretty sure to find more difficulty in resolving this 'Wortstreit' over truth by an appeal to the distinction between the nature and the function of truth than does Dr. Jacoby. They will find it more difficult to separate the nature of truth from its function than he does. They will observe that although the difficulties in the conception of correspondence are recognized, yet it is not quite clear to the author that the problem of the correspondence of ideas with facts cannot be solved apart from that of their 'application to problems.' Moreover, if the question of correspondence were soluble wholly on its own ground, we should then have to face the difficulty of making the transition from correspondence, — *i. e.*, from the *nature* of truth to its effectiveness in further experience; *i. e.*, to its *function*. After truth as correspondence is determined, how does it further operate? Obviously an appeal to will at this point, to make truth in further experience⁷ after its correspondence character is decided, is merely verbal.⁸

Again, in the midst of excellent expressions of the spirit and method of the pragmatic movement, some will find a discordant note in the author's hope that truth will some day become a perfected system, though he adds: "Vorläufig sind wir von diesem Zielpunkte noch weit entfernt!"

The author points out that the pragmatic movement calls for rewriting of much of the history of philosophy to bring it into closer connection with the "Gemütsbedürfnisse und Willensbedürfnisse die jenseits des Verstandenslebens liegen."

Most of Dr. Jacoby's citations are from the writings of Professor James. His reference to Dewey and Schiller as 'Anhängern' of James raises a smile and verifies the author's confession of Germany's ignorance of the movement.

The style is very simple, clear and fresh.

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CONSCIOUSNESS AND PSYCHICAL PROCESS.

Die Stelle des Bewusstseins in der Natur. JULIUS PIKLER. Leipzig: J. A. Barth, 1910.

This book embraces an analysis of consciousness with respect to its structural and functional aspects, free from hypothetical considerations and using as analogon such physical concepts as resistance, work, impedance, etc.

An explanation of noetic phenomena is derived from a consideration of the physical conditions of the organism occurring simultaneously with them, together with the effects remaining from previous neural processes which manifest themselves as tendencies. The author believes that neural opposition is the essential condition of consciousness, a fact the importance of which contemporaneous psychology has persistently overlooked.

Functionally, consciousness is a device which brings about the most efficient adjustment between the organism and the external world with the least expenditure of energy. The aim of the author is to show that mental phenomena lend themselves to analysis in the same way as do physical occurrences, in fact that there is no essential difference between them.

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Psychical Process. H. JOACHIM. *Mind*, N. S. 1909, XVIII., 65-83.

The following summary of Mr. Joachim's paper is mainly by quotation. He begins by analyzing a conception which he later rejects, that is, by considering (p. 5) "the familiar distinction between Idea as meaning and Idea as psychical fact. . . . A judgment as 'meaning,' 'significance,' or 'logical content' is a bit of knowledge . . . so far . . . as it is true. This meaning is something 'objective' and common to all sane intelligences. It is universal; independent of particular conditions of time and place. . . . Any constituent portion [of the judgment in this sense] is a . . . *logical* idea."

"But every judgment (p. 66) is made by some person and is thus a *judging*, . . . a process. . . . a succession of events, . . . it is unique or singular. . . . The same distinction applies, e. g., to emotion and to volition.

"We are to examine psychical process" (p. 67) not "as the unfolding of a personality" but "in a more dubious sense. Within the total occurring experience we are to suppose a distinction to be drawn. . . . This my judging (so it is supposed) *is* or *involves* some sort of 'process' or 'mechanism' or 'happening' *in* or *of* my mind. . . . *What* is this psychical process? . . . Not *what* I see or hear or apprehend when I see the red thing or hear the chord. I am not aware of rods and cones, nor of organs of Corti . . . nor of any psychical process which accompanies . . . physiological changes. *What* exactly I see or hear is a problem which . . . we need not *here* investigate.

"For whom then (p. 69) is the psychical process . . . *who* is aware of it and *of what* . . . is he aware? . . . I believe that no one is . . . aware of 'psychical process' in the sense . . . in which we have been taking it. . . . [For] there is no such thing. . . . In disengaging the 'psychical process' . . . from the mind whose process it was we have removed it from the atmosphere in which it drew the breath of its life and 'it' has ceased to be."

Upholders of 'psychical process' urge that a severance should be "made between *what* the mind thinks and the process of its thinking (p. 73). *What* it thinks is a logical content. . . . The 'solid facts' which remain are 'singular and unique' and thus sharply contrasted with the universal and common meaning, the logical content. . . . Now *in what sense* are these processes 'singular and unique'? For there is a sense in which all phenomena are 'singular and unique' . . . severally fixed determinate positions within a complex of relations. . . . But the 'psychical processes' are 'singular and unique' in a further sense. For any actual thinking is as a psychical process inseparable from the 'individual mind.' . . . [And] mind is not that *in* or *of* which processes are . . . it is essentially itself a process, . . . a unity which is 'one for itself' . . . a differentiated 'unity of awareness' . . . If we compare (p. 77) this account with the description with which we began we may say (p. 78) either that the distinction between 'process of apprehending' and 'object apprehended' has . . . vanished; or that we have introduced the notion of 'process' into our conception of the object. . . . For 'images,' ideas, or symbols *if we retain the distinction between process of apprehending and object appre-*

hended fall always on the latter side of the division; and thus in describing them the psychologist is doing the work of the logician."

By this argument Mr. Joachim seems to the writer of this notice, to make two points: he shows that 'mind,' not 'idea' or 'psychical process,' is the subject matter of psychology; and he shows the impossibility of the sharp, conventional distinction between 'logical' and 'psychological' object. The main defects of the paper are first, the brevity of the discussion of mind: it is difficult for the reader to know what Mr. Joachim means by a 'process' which is a 'unity of awareness.' And, in the second place, Mr. Joachim ought surely at least to have indicated his solution of the problem of the object which "I directly see or hear."

Mr. Joachim concludes with the interesting suggestion that psychology should "begin at the other end. . . . The personality of the moral agent," he says (p. 83), "is revealed in the moral system. . . . The personality of the thinker is 'writ large' in knowledge. And mind as emotional is broadly expressed in art and religion. In Art and Morality, in Religion and Knowledge the nature and functions of mind are plain to read: and from the study of them the study of mind should start. Such a Psychology would be essentially part of Metaphysics. For its subject matter would be the most developed and most significant manifestations of the real mind incarnate in the universe at the level and in the forms of its self-conscious expression." Psychologists may well adapt this counsel to their uses; but the result need not be a psychology which is a part of metaphysics. The moral, the religious, the logical, and the æsthetic experience are scientific facts so long as they are scientifically apprehended, and become metaphysical only when discussed from the point of view of ultimate reality.

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Zwei Vorträge über dynamische Psychologie. JULIUS PIKLER.
Leipzig: J. A. Barth, 1908.

These lectures were given before the International Congress of Philosophy at Heidelberg, 1908, and outline the author's theory of a dynamic psychology.

The principle upon which all mental phenomena is based is that of opposition. Physical forces in the external world modify physical forces within the organism; when such modifications persist, tendencies remain which influence the course of future modifications. Consciousness is the expression of the interaction of these tendencies.

The ease with which the theory can be applied to even so involved a subject as the epistemology of pragmatism is illustrated in the second lecture. In view of the fact that experimental research is being planned more and more with respect to theoretical considerations, it seems to the reviewer that Professor Pikler's lectures are especially valuable because of the clear and concise manner in which the subject-matter is presented.

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PERCEPTS AND IMAGES.

Percepts and Images. C. READ. British J. of Psychol., II., 323-337.

This paper begins with the reminder that "the difference between Percepts and Images" though it "seems so obvious . . . has not yet been determined to the satisfaction of psychologists." The theory suggested by Read is based on a paper by Gotch: Perception "is a state of relative dissociation, a restriction of consciousness (p. 326). . . . Perception passes from object to object by a sort of check action; each object, if one stops there, is final. Images . . . either . . . continually undergo transformation into other images or they fade away." Yet Read is forced to concede that some perceptions and not all images are followed by associations. He therefore proceeds to make what is virtually a second distinction between the two — a distinction which he, however, seems to regard as equivalent to the first. "In perception" he says (p. 328) the object holds the eye but in phantasy the mind's eye has to hold the image. The difference seems to be due to the definite reflex of perception which adjusts the sense-organ and maintains the continuity of the stimulus. Thus a circular activity is set up: the stimulus excites an adjustment which maintains the stimulus which maintains the adjustment, and so on. An image may also be assumed to excite a reflex adjustment . . . but not resulting in a definite adjustment of some organ . . . and of course there is no circular activity."

The dissociation thus appears, on Read's own showing, as a frequent but not an invariable distinction between perception and imagination. The conception of a circular activity of sense-stimulus and adjustment of sense-organ is, on the other hand, a useful extension of the common conception of perception as the consciousness involving present stimulus of sense-organ.

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MEMORY.

Le souvenir du présent et la fausse reconnaissance. H. BERGSON.
Revue Philosophique, 1908, LXVI., 561-593.

The phenomenon of *false recognition* is an illusion described as unreal and inevitable, that lasts for a few seconds, during which time the subject is possessed of a conviction that what he sees, hears or does he has previously, and under identical conditions, seen, heard or done. One feels that he is cut off from the flow of reality and that he can predict but cannot control the next moment of the past which he is re-living.

The natural functioning of perception and memory and the relations of these two processes Professor Bergson offers as the explanation of false recognition. "The formation of the 'souvenir' is never posterior to that of perception; it is necessarily contemporaneous with it. To the extent that perception creates itself, the 'souvenir' outlines itself at its side, like a shadow at the side of a body." The continuity of consciousness does not grant an end point to perception and a juxtaposed starting point to memory; that the two processes begin together seems to be the only tenable supposition. That the processes are separate and distinct the obvious difference between perception and memory, considered as states of consciousness, gives evidence. Perception, allied with the volitional side of consciousness, is joined with an awareness of a present that is ever pushing into the future; memory lacks the volitional element; its image is recognized as cut off from progressive reality and bears as its mark 'past time.'

The 'souvenir,' revealed in its immediate present, would be an unreal, inevitable, time-marked something—a memory of the present. That such a revelation does at times occur seems probable. The 'élan' of consciousness, ordinarily opposed to the return of the present upon itself, is sometimes momentarily arrested, notably when one perceives a new or unusual spectacle, and, under such circumstances, it is possible to conceive of the entrance of the 'souvenir' into the field of attention. An oscillation between the image of memory and the image of perception then gives rise to the illusion, false recognition, which might better be named 'le souvenir du présent.'

QUEEN L. SHEPHERD.

UNIVERSITY OF WISCONSIN.

Du rôle de la mémoire dans les rythmes biologiques. HENRI PIÉRON. Rev. Philos., 1909, LXVIII., 17-48.

Can periodic excitation establish a corresponding rhythmic reaction in an individual? If so, will the rhythm thus established persist

for a while when the exciting cause has been removed? When a persistency is observed, in the absence of the stimulus which has engendered the rhythm, can we be sure that we are dealing with an acquisition really made by the individual, and not with an hereditary rhythmic tendency?

The answer to these questions is connected in the mind of the author — and of biologists in general — with the presence of memory. For, they argue that the persistence of the reaction after the removal of the excitation means the remembrance of the stimulus.

The paper summarizes the existing evidence on these questions. The rival theories of Pfeffer and of Semon are discussed in the light of their own and of subsequent experiments. The former holds that when, for instance, one displaces in *Acacia* the natural 12-hour rhythm by an 18-hour rhythm (established by means of artificial light and obscurity) and that this artificial rhythm persists for a while when the plant is returned to normal conditions, one has a demonstration of a rhythm-memory. Semon, on the contrary, would substitute for that explanation a *memory of the species*.

Whatever hypothesis one may accept, it is now an established fact that plants can acquire individual rhythms persisting for a certain length of time after the removal of the stimulus.

Corresponding facts have been observed in the behavior of many Protozoa. A few pages are devoted to organic rhythms in vertebrates.

The conclusion of the author is that, in general, "the intervention of an hereditary persistency is far from being the rule; that influence is even in most cases doubtful, whereas the facts indicating an individual acquisition (rhythm memory) are extremely definite, very numerous, and manifest a profound identity throughout the animal series." He adds the important remark that in the case of the so-called rhythm-memory the acquisition is rapid, a very small number of repetitions being always sufficient to engender a new rhythm. In a few days one can establish in the leaves of *Acacia* a rhythm of 6 hours as persistent as the normal rhythm of 12 hours.

The psychologist will, of course, question the right of the biologist to posit a memory-experience on the ground of the establishment and tenacity of rhythmic movements. May not acquisitions of this sort involve merely physiological processes, *i. e.*, no memory at all?

JAMES H. LEUBA.

BRYN MAWR COLLEGE.

The Mechanism of Amnesia. ISADOR H. CORIAT. Jr. of Abn. Psychol., 1909-1910, IV., 1-16; 236-241.

In some preliminary remarks the distinction is made between (1) amnesias of conservation and (2) amnesias of reproduction. In the first, the brain does not keep impressions. In the second, the impressions are there; it is the reproductive processes that are at fault. In this case special methods may bring back the lost memories by achieving a synthesis of the dissociated mental contents.

The substance of these papers consists of records of amnesias due to various causes — epilepsy, alcoholism, cerebral concussion, etc.— and of the result of efforts to restore, by the method of distraction, the lost experiences. The cases are classified in three groups. In those of the first group, success was complete; in those of the third, failure was absolute.

J. H. LEUBA.

BRYN MAWR COLLEGE.

Les insectes ont-ils la mémoire des faits. FÉLIX PLATEAU. Année Psychol., 1909, XV., 148-159.

Plateau, in this series of experiments, tried to ascertain whether bees, frightened by their capture and confinement, would return to the flowers upon which they had been seized. In his opinion, if they do not it shows that they retain no memory of previous experiences. The bees which visited a certain flowering bush were caught and put into a tube. After carrying the tube some six or nine feet away, Plateau held it horizontally toward the flowers so as to allow the bees to escape. Out of sixty trials, twenty-five bees were seen to return. The observer was unable to trace all of the remaining thirty-five. Convinced that he had lost track of some other bees, Plateau modified the experiment by placing coloring matter in the tube for the purpose of more easily identifying the captives. Two bees were tested. The first returned to the flower four times in twenty minutes while the second returned five times in the same period. Plateau did not carry the experiment farther because of the effect of fatigue on the bees. As a result of his investigations, he concludes that these insects have no memory of events.

These experiments, taken in connection with similar investigations made by others, indicate that the bee's experiences, no matter how vivid or how oft-repeated, do not at all modify its desire to return to the flower in search of food. Instinct seems to predominate. Plateau agrees with other investigators that the so-called memory of places is gained only by orientation and that the 'recollection of time' is no

more than an associative process. Instinct and intelligence, he insists, are distinct and should not be confused.

HAROLD A. LYNCH.

WASHINGTON UNIVERSITY,
ST. LOUIS.

EMOTION.

Certain Pulse Reactions as a Measure of Emotions. ISADOR H. CORIAT. J. of Abnormal Psychol., 1909, IV., 261-279.

The author investigates the relation of conscious, sub-conscious, and co-conscious emotional states to the heart-rate. The subject is placed in a reclining position and allowed to listen to a monotonous sound stimulus. There soon appears drowsiness, limitation of voluntary movements, and either relaxation or cataleptic state,—after a few minutes a slowed heart-rate. The test words are then given and the pulse rate taken with a stop-watch. The association times are also recorded. Cases of paranoia, psychasthenia, dementia præcox, and hysteria are studied.

The author states that words connected with an emotional complex cause long reactions and faster pulse, while intellectual problems, painful stimuli, sudden noises, and indifferent words give no change. The clearness of the response decreases as the patient improves.

The state of distraction in which the subject is placed involves uncertain elements, the method seems to me too crude, and the author apparently does not know of the numerous investigations of the relation of heart-rate and mental activity.

JOHN F. SHEPARD.

UNIVERSITY OF MICHIGAN.

Some Neurological and Psychological Aspects of Shock. WILLIS L. GARD. Ped. Sem., 1909, XV., 439-473.

Dr. Gard has attempted only a tentative survey of this general field. He finds the term shock used loosely "for the disturbing effects both bodily and mental of almost any sudden and intense experience." Incomplete preadaptation brought about by stimuli of certain degrees of intensity and suddenness constitute the general cause of shock. A review of the theories shows that shock causes "physically an excessive catabolic action of the nerve cells resulting in an alteration of their nutritional condition or in some chemical change in the substance of the axis cylinder. The excessive stimuli may change the conductivity of the synapse or cause movements in the neuroglia cells or dendritic processes." Prince believes that the causal factor of accident neuroses is the psychical or emotional element. Children are less subject to

traumatic shock than grown people and are more exposed to psychic shocks resulting from fright and sudden phenomena. A summary of the immediate and lasting effects of shock follows. A number of instances are also cited to show the educative and reformative value of stimuli containing highly emotional factors, upon individuals and social groups.

C. S. YOAKUM.

UNIVERSITY OF TEXAS.

SUGGESTION, IMITATION.

Zur Begründung und Anwendung der Suggestionsmethode in der Normalpsychologie. LILLIEN MARTIN. Archiv f. d. ges. Psychologie, 1907, X., 321-402.

The author has attempted to view the whole territory of normal Psychology through the telescope of Hypnotism or 'the suggestion method.'

Five normal subjects are used. A combination of methods is employed to induce the hypnotic condition. The subjects are told to imagine as clearly as possible their usual experiences on going to sleep; to look fixedly at a metal point which the operator holds and allows to sink gradually; to close the eyes whenever they feel like it, and to 'relax.' Suggestions of heaviness, fatigue, and finally of sleep are made.

In general the experiments consist of tests which aim at a thorough comparison of the normal and the hypnotic conditions, in the fields of sensation, movement, memory, association, attention, feeling and will, together with an investigation of the kind and degree of suggestibility which each subject evinced in each field during hypnosis. Hallucinations and post-hypnotic suggestion are also considered. The results are presented as tabulated answers to questions classified under these various subdivisions.

To determine the exact condition of the subject during hypnotism, observations and tests were first made concerning the degree of hypnotism, amnesia upon waking and rapport of subjects with the operator. The results of all these preliminary investigations "to determine the exact condition of the subject" are so variable that the remaining bulk of experiments appear to rest upon a foundation of shifting sand. None of the subjects show signs of analgesia — and only one of anaesthesia; all make automatic movements; only one is incapable of voluntary movement; catalepsy exists in all but one — but is variable in different parts of the body at different times — and

seems to resolve itself into a wish to please the operator. Influence of suggestion varies with the subject. Tests for comparison and disturbance of sight, hearing, taste and smell show results varying greatly with the individual. Kinæsthetic sensations are undisturbed, except as a result of special suggestion in a few cases. The author draws the conclusion that no arbitrary description or classification of hypnotism can be possible because the variable results show that each individual is a law unto himself — and hence any one or two terms used to classify his behavior would be inadequate in any given case.

The author seeks to compare clearness of memory in the two conditions by the subject's own introspections. Obviously, such results cannot be accurate. Only one subject experienced suggested hallucinations. Post-hypnotic suggestions were carried out by two subjects, while results with the other two are very variable when they are obtained at all.

It was found impossible to trace in hypnosis the source of associations of which the subject was not aware in the waking state. "Submerged feelings" were likewise not cleared up.

In conclusion, the author states that the suggestion method is important because by its means we can "penetrate the subconscious," and that many "freisteigende" ideas will doubtless disappear as such if the suggestion method is used, and that "it is even possible that some light may be thrown on the persevering tendency." However, a careful consideration of the results leads one to believe such a sweeping application of them to be quite unwarranted.

The stress which the author lays upon individual differences is the underlying tone of the whole article.

BERENICE BARNES SHEPARD.

UNIVERSITY OF MICHIGAN.

L'Imitazione. G. PISTOLESI. Turin, Fratelli Bocca, 1910. Pp. 190.

The author rightly opposes (pp. 22, 183) the common view, that imitation is the "fundamental principle of the psychic life," on the ground that opposition or counter-imitation is an equally original, if less common, tendency. On the basis of well devised class-experiments on her own pupils she distinguishes (pp. 166, 179 *et al.*) between "(1) servile imitators; (2) those who, though imitators, try to . . . transform . . . the objects of their imitation; (3) those who imitate seldom if ever, and who . . . under compulsion, imitate in such wise as to affirm their own personality."

Among the most significant of the experiments is that reported

(pp. 98 ff.) in which the author, repeating Binet's experiment to discover the relation between imitation and suggestion, concludes, in opposition to Binet, that imitation is not a form of suggestion. A second group of experiments (pp. 151 ff.) concerns mental imitation (*l'imitazione nel pensiero*). The simple tests proposed are ingenious and well adapted to their purpose. Among the conclusions from these and other experiments are the following: Of several models that which is easy and that which is near at hand is imitated. "Of several equally easy models that which shows some originality is chosen." "The multiplication of models lessens servile imitation." "We always imitate [our superiors] and especially our immediate superiors."

MARY WHITON CALKINS.

WELLESLEY COLLEGE.

VOLITION.

Ueber Theodor Lipps' Versuch einer Theorie des Willens. JULIUS PIKLER. Leipzig: J. A. Barth, 1908.

In this book Professor Pikler criticises Lipps' theory of the Will as given in *Vom Fühlen, Wollen und Denken*.

Lipps maintains: Every image has inherent in it a tendency to be perceived as real. Striving occurs when this reality tendency is hindered by a reality tendency of opposite or contradictory character. Pikler accepts these facts but believes Lipps has overlooked the fact that any conscious state whatever can only come into existence because of this principle of opposition. Belief and disbelief occur simultaneously in every conscious state. Every object *is* something and in addition *is not* something else. The author withdraws the proposition from the criticisms which have been effective against the theories of relativity by holding that the first link of a system of contrasting objects is not a conscious occurrence. The presence of a previously unrecognized object within the sensory range of the organism modifies the organism so that when subsequently the contradictory occurs within sensory range, both the object and its opposite may appear in consciousness.

Phenomena of striving are considered more complex than Lipps' theory demands; involving not only the reality tendency but also recognition, interest, affection, etc. No attempt is made to isolate the essential factor of striving, yet the analysis so strongly emphasizes the correspondence of neururgic facts and noetic phenomena that the reviewer believes it to be a valuable contribution to psychological theory.

A. P. WEISS.

UNIVERSITY OF MISSOURI.

Ueber periodische Schwankungen in die Schnelligkeit der Auf-einanderfolge willkürlicher Bewegungen. HANS BERGER.
Zeitsch. f. Psychol., L., 321-331.

With practically the ordinary laboratory recording and time apparatus, Professor Berger investigated the character of the eye-lid reflex when made voluntarily and of the isolated movements of each of the fingers. Beside being voluntary, the other condition was that they should be made as rapidly as possible. The time of each test ranged from ten to twelve seconds. In all cases, he found optimum points where the time necessary to make a single movement was much less than for the other contractions. These most rapid single movements occurred at intervals of three to six seconds. B. assigns the phenomena to the cortical areas of the brain. He finds this variation similar to phenomena found by previous investigators. He finds that these variations in physical and psychical activity correspond in length to the vascular waves. These, then, constitute the cause of periodicity in brain function.

C. S. YOAKUM.

UNIVERSITY OF TEXAS.

Conation and Mental Activity. W. H. WINCH. Jour. of Philos., Psychol., and Sci. Meth., 1909, VI., 477-485, 505-514.

Conation is elementary. It is not found merely in complex mental states, but includes also 'felt tendencies' that have no conscious end. The focalization of attention, the definition of a want, change the elementary character of the tendency and the simple conative aspect passes out of sight. Conation is not co-extensive with mental activity, but "activity or affectiveness is the very essence of the conative state." Nor is this 'tendency' to be identified with the self. In working over an idea, in endeavoring to actualize it, the coalescence of conative tendency and idea bring realization of the idea, make it a fact. The conative attitude says, "I shan't be happy till I get it." Pleasure and pain are attitudes distinguishable from this. Nor is the mind a sensation-complex, rather its growth is conditioned by conations that by direction and training become purposive groupings of sensations and percepts. The writer makes appeal from time to time to introspective facts, but his analysis is drawn mainly from a behavior standpoint. He takes a more decisive stand on the question of a separate conative element than does Professor Stout. In many respects, the article suggests the point of view in McDougall's Social Psychology.

C. S. YOAKUM.

UNIVERSITY OF TEXAS.

Zur Lehre von der motorischen Apraxie. KURT GOLDSTEIN. J. für Psychol. und Neurol., 1908, XI., 169-187, 270-283.

The case reported was that of a woman who had had an apoplectic attack on the left side, and partly recovered. The left arm seemed as though it belonged to another person and was independent of her will. When it seized anything she could not voluntarily release it. The sensibility of the left side was interfered with, especially touch and senses having to do with orienting the limbs. Some spontaneous movements were made with the left hand, such as wiping the face or rubbing the eyes; but these were much reduced. Only after repeated attempts could simple movements be carried out from spoken command, and then slowly and often incompletely; and this even when they had been involuntarily performed before. Furthermore, the wrong movement might be made. Movements made were in general quite habitual. There was no real ataxia, simply a slowing. Hence the motor disturbance could not be due to the failure of sensory stimuli. When objects were placed in the hand (eyes closed), the subject could not recognize and handle them until they were named. She could not imitate movements seen, nor reproduce on the left side what she was put through on either side. There was no disturbance of attention or other intellectual processes.

The sensory-motor apparatus for the left side must be judged intact but in some way more or less isolated. The author discusses the process of acting and finds that before a stimulus can lead to a response it, together with the member to be moved, must be taken up into a space construction, which is the same for all senses and therefore has at basis a space region of the cortex. This is the central organ in memory, will, and all higher processes, since through spatial unity all sensations are united into an object. By repetition more immediate motor systems, shortcuts, may be built up.

Motor apraxia would then be due to a break between the space center and motor cells. Pathological results show the left hemisphere to be of dominant importance for space constructions on both sides, and in all apraxia there is a break of connection from the left frontal lobes to the motor apparatus concerned. Hartmann locates the spacesphere in the frontal lobes, but the author is doubtful whether this is warranted. The frontal lobes may be simply a main link between the motor cells and the more extensive space center. At any rate the left center is necessary for complicated reactions, and so a lesion of the corpus callosum would explain many of the characteristics of the present case. But the right center (through right frontal lobe) would

probably be sufficient to allow reproduction of movements which the subject is put through on the same side and a simple appreciation of the quality of sensations. This is not the case, and so the break must include fibers from the motor cells of the right hemisphere to the right frontal lobe. It is probably in the subcortical tissues of the right central convolutions.

The psychological analysis and space-center theory, common to several writers, might arouse some objection from a psychologist; and comparison with experimental and other work on the function of the frontal lobes might yield a more complete interpretation. But it is a suggestive article.

JOHN F. SHEPARD.

UNIVERSITY OF MICHIGAN.

FATIGUE.

Die geistige Ermüdung. MAX OFFNER. Berlin: Reuther & Reichard, 1910. Pp. 88.

This summary of fatigue investigations is written by a schoolman and lays special stress on the application of results to the work of the school.

"Fatigue is a condition of our organism which is occasioned by work, and along with other signs is mainly characterized by a decrease in the power to do work and in the desire to work." O. considers the investigation of fatigue as falling under two general methods, the subjective, or symptomatic, and the objective. The latter offers two chief types, the physiological and the psychological. The first includes ergographic tests, pulse curves, tapping, etc. The second falls into two divisions, those methods that apply psychical tests different from the fatiguing work and the method of continuous work.

The writer summarizes results under two main heads, the factors involved and the laws of fatigue. This part of the article is not detailed and omits considerable material. Some of his conclusions would perhaps be considered too final by those working in this field. The work of the physiologist and neurologist, because not immediately applicable, receive slight notice in the discussion of methods or results.

Throughout the paper, the writer seeks to apply the facts reviewed and but briefly criticized, to school work. O. offers a number of valuable suggestions and cites several experiments in different German schools that aim to revise the methods of instruction, arrangement of studies and number and length of instruction hours according to the laws of fatigue.

A bibliography is appended.

UNIVERSITY OF TEXAS.

C. S. YOAKUM.

LOGIC.

The Logical Foundations of Mathematics. R. B. HALDANE. Mind, N. S., 1909, XVIII., 1-39.

In his recent book, *Principles of Mathematics*, Mr. Russell criticized Mr. Haldane for a reference to the use made by Leibnitz of the term infinitesimal. Mr. Haldane had pointed out the confusion which had resulted from the treatment of infinitesimals as minute discrete quanta, the magnitude of which might be disregarded. Mr. Russell in his book says that while that may be true of the calculus of Leibnitz and the older mathematicians, Mr. Haldane's criticism will not hold of the more modern treatises on the magnitude concept. Now, says Mr. Russell, "the whole subject proceeds without ever introducing the infinitesimal, that the fundamental conception is that of a limit, and that a limit is something quite different from what non-mathematicians suppose it to be."

Mr. Haldane answers Mr. Russell by showing that what he is really dealing with is not a strictly mathematical concept, but a question of epistemology; and by pointing out at some length that Mr. Russell's interpretation of the Kantian Categories of Time and Space is a misinterpretation, due to the statements in the *Aesthetics*. Mr. Haldane goes on to point out that as a matter of fact even in the purest forms of mathematics there is still something of the reference to reality, and that it is not alone a matter of pure symbolic logic at the foundation of the mathematical concept.

J. H. KEEN.

UNIVERSITY OF TEXAS.

MENTAL DIAGNOSIS.

The Association Reaction Method of Mental Diagnosis (Tatbestandsdiagnostik). R. M. YERKES and C. S. BERRY. Amer. J. of Psychol., 1909, XX., 22-37.

The paper describes four experiments in *Tatbestandsdiagnostik*, two of which were performed before a laboratory section in the summer term at Harvard.

In the first experiment the subject withdrew from the experimenter and carried out one of two acts designated, in this case the discovery of either a rat or a pack of cards in separate boxes. He then reacted to a series of words, a few of them being relevant to the act performed, by giving the first associated word. The reaction times were measured by the Hipp chronoscope. The relevant words gave longer reaction times, as well as a greater range and a greater variability of reaction

times, so that the operator was able to tell which act had been performed.

The second experiment was to determine which of two subjects had performed a designated act. Two subjects withdrew with a folded note of directions, which only one of them was to read and carry out. They were directed also to try to conceal from the experimenters which one of them had performed the act. The significant words gave, in the subject who had performed the act, longer reaction times, a greater range and a greater variability, and in some cases very obvious inhibition.

These two experiments were repeated with two graduate students in psychology as subjects. In Exp. 3, the subject was directed to try to conceal which act he had performed. His reaction times to significant words were not longer, and the basis for decision was uncertain. But it was clear that the subject had given reaction words not suggested by the words of the series. Yet in the series containing the significant words the variability of reaction times was great, but as this series was given first, the variability might be attributed to lack of practice.

Exp. 4 was a repetition of Exp. 2 and gave positive results. The reactions of the subject who performed the act showed inhibition for the significant words, a great variability of reaction times, and several references to objects concerned with the act. A two-page bibliography is given, but there are no comments on it.

W. S. ADKINS.

UNIVERSITY OF TENNESSEE.

GENERAL REVIEWS AND SUMMARIES.

GRAPHIC FUNCTIONS.

BY JUNE R. DOWNEY,

University of Wyoming.

Few contributions to this subject have appeared during the current year. Katzaroff¹, continuing Ivanoff's investigation of the drawings of children, has compared 2,600 drawings from 2,500 children of both sexes to determine the natural interests of children and to see how these interests are related to the sex, intelligence, and environment of the children. In these drawings the children chose their subjects freely, without instruction. The freedom and success of the child in producing such preferential drawings leads to the inference that instruction in the art of drawing should follow the line indicated by the child's spontaneous efforts.

The environment is seen to play an important part in determining the objects to be copied. The uniformity shown by different children in the reproduction of familiar objects, the schematic nature of such drawings, and the persistence of the first impression of the object are important observations.

An attempted correlation of the types and degrees of intelligence with choice of subjects gives little result. More fruitful is a comparison of the choice of subjects by boys and girls. It is found that the latter prefer flowers, geometrical figures, fountains, the sky and sun, and geographic maps; the former choose to reproduce such objects as animals, scenes from life, landscapes, boats, horsemen and railways. While the influence of the social environment is not ignored, it is deemed probable that the girls prefer geometrical and ornamental designs because the drawing of these demands only application and careful attention; the boys, on the other hand, exhibit in their choice of models vivacity of imagination and of observation. Drawing appears to be a natural form of expression for boys; an acquired form for girls. The boy may reveal artistic talent; the girl only graphic aptitude.

This conclusion is interesting in its bearing upon the question as to the revelation of sex in the handwriting of adults. Downey² has repeated Binet's statistical investigation upon judgments passed on the sex of handwriting and confirmed his conclusion that handwriting reveals sex even to the amateur observer in something over sixty cases

out of a hundred. As in Binet's investigation, three classes of handwriting are found: (1) That in which the sex is apparent; (2) That in which the sex revelation is ambiguous; (3) That which exhibits the signs of the opposite sex. The present report indicates the pressure of a social judgment operating in such a way as to increase the number of masculine judgments passed. A social rather than a psycho-physiological interpretation of the results is suggested by the fact that the inversion of sex-signs occurs more frequently in the handwriting of women than in that of men and is found most frequently in the case of those whose occupation requires much clerical work.

The varying facility of untrained individuals in interpreting the sex-signs is shown and the results summarized with reference to the types of judgment exhibited and the degrees of confidence manifested.

In a preliminary study of family resemblance in handwriting, the same writer¹ has attempted to apply the serial method of arrangement and rearrangement, according to the likeness to a given model, to collections of handwriting in order to determine (1) the subjective element in judgments passed on resemblances in the general appearance of handwriting specimens, and (2) the degrees of resemblance found within any particular collection. Wells' method of determining the subjectivity of judgments passed upon a particular sort of material is utilized.

It is found that judgments on similarity in handwriting have a large subjective element; that a judgment of similarity is less easily passed than one of dissimilarity; and that similarity may be of many kinds. Even so, some remarkably uniform judgments of similarity between the handwriting of different members of the same family are instanced. Such resemblances, apparently, cannot be accounted for on the ground of similarity in education and in social environment for they occur frequently in the case of relatives who have had different training and are unlike in age and sex. A resemblance between the handwriting of persons related in the second and third degree is found frequently.

The most suggestive result, however, is that which points out the existence in the same family of distinct handwriting types, which may be very unlike one another. The possibility of such grouping is one of the requirements that the analytical method of study of inheritance demands. Hence its importance.

¹ KATZAROFF, M. D., 'Qu'est-ce que les enfants dessinent?' *Archives de psychologie*, 1910, Vol. 9, 125-133.

² DOWNEY, J. E., 'Judgments on the Sex of Handwriting,' *PSYCHOLOGICAL REVIEW*, 1910, Vol. 17, 205-216.

³ DOWNEY, J. E., 'Preliminary Study of Family Resemblance in Handwriting,' Uni. of Wyom., Dep't of Psychology, 1910. Bulletin, no. 1, pp. 51.

DISCUSSION.

THE GALVANIC PHENOMENON.

In a note published in *THE PSYCHOLOGICAL BULLETIN*, May 15, 1910, Mr. Dunlap passes a severe criticism on all psycho-galvanic work done until now, and especially the work done by Dr. Nelson and myself. Mr. Dunlap's objections, however, are based on several misconceptions.

First, he is wrong in thinking that we brush aside the work done by Waller, Einthoven and others. On the contrary our work is in full accord with that of the above investigators. Their work is in accord with our conclusions based on a long series of experiments that the galvanic deflections of the 'galvanic reflex' are due to an E.M.F. which is muscular in origin, since the heart is essentially a muscle—its histological structure being intermediate between striated and unstriated muscle.

Second, the zero obtained by us by means of the pure platinum hypodermic electrodes is an absolute zero. *There is no difference in the reading on opening or closing the circuit.* This zero reading remained steady for hours. This excludes polarization of the electrodes by the tissue-fluids. *The zero-reading is steady until the animal is stimulated.*

Thirdly, as to the potential of different points of the body on which Mr. Dunlap lays so much stress, I can say that in all our experiments we found that it made no difference whatever as to where the hypodermic platinum electrodes were inserted. Mr. Dunlap's 'potentials' are entirely hypothetical as far as the hypodermic electrodes are concerned. We inserted platinum needle-electrodes in different parts of the body, in the same limb or in different limbs, or but a few inches apart and found no deflections whatever. This too is fully in accord with all the work done in physiology, namely that there is no current of rest.

Fourth, the platinum electrodes pick up an E.M.F. when it exists in the living or non-living animal tissues. Mr. Dunlap utterly misconceives the strength of our experiments on secretion of the shoulder and arm-pit. The E.M.F. existing in the secretion of the shoulder and arm-pit are not due to the physiological processes of secretion, but to the chemical decomposition of the products of the sudorific glands.

The shoulder gives almost no sweat, while the arm-pit is rich in secretory glands. The E.M.F. is generated by the decomposition-products of the sweat itself. This can be demonstrated by any other non-polarizable electrodes.

Mr. Dunlap writes "The record of the experiment in which the electrodes were moved in the tissue is not convincing. Apparently the movements were made before the galvanometer deflections had become zero." This is incorrect. The zero reading in all such experiments is absolutely steady as is clearly stated in the paper and distinctly shown in the curves.

Mr. Dunlap thinks that the galvanic reflex has not really been established. About three years ago when Dr. Kalmus and myself started on this work we had the same scepticism and objections as Mr. Dunlap advances now. After having carried out a long series of experiments at the Physical Laboratory of the Mass. Institute of Technology, Dr. Kalmus and myself demonstrated beyond a shadow of doubt that the galvanic reflex is a fact. The present work with Dr. Nelson corroborates our former work and proves uncontestedly that the galvanic reflex is not due to any artefacts or to polarization, or to the action of bodily tissues, but that it is due to an electromotive force generated by muscular activity under the influence of emotional and affective states.

Mr. Dunlap says: "The topography of the potential differences has not even excited their curiosity. Sidis for example does not show that the two electrodes when placed an inch apart would not give the same deflection as when in opposite limbs." The place of insertion of the electrodes makes no difference whatever in the galvanometric deflections. The place of insertion shows no difference of potential.

Instead of speculating and advancing hypotheses about imaginary bodily potentials, Mr. Dunlap or any other doubter is invited to come to our laboratory and witness the *facts*. In case physiologists and psychologists or psychopathologists are not regarded as authoritative, physicists of the Physical Laboratory of the Mass. Institute of Technology will be glad to demonstrate the truth of the galvanic phenomenon and the results obtained in our investigations.

BORIS SIDIS.

SIDIS PSYCHOTHERAPEUTIC INSTITUTE,
PORTSMOUTH, N. H.

BOOKS RECEIVED DURING JULY AND AUGUST.

The Spiritual Nature of Man. STANTON COIT. London: West London Ethical Society, 1910. Pp. 112.

Genesis: A Manual for the Instruction of Children in Matters Sexual. B. S. TALMEY. New York: Practitioners' Publ. Co., 1910. Pp. 194. \$1.50.

The Psychology of Efficiency. HENRY ALFORD RUGER. New York: The Science Press, 1910. Pp. 88.

School and Class Management. FELIX ARNOLD. New York: Macmillan Co., 1910. Pp. xii + 288. \$1.00 net.

Educational Psychology. E. L. THORNDIKE. New York: Teachers College, Columbia University, 1910. Pp. 248. \$1.50.

How We Think. JOHN DEWEY. Boston: D. C. Heath and Co., 1910. Pp. vi + 224.

Time and Free Will. HENRI BERGSON. Trans. by F. L. Pogson. London: Swan, Sonnenschein and Co., 1910. Pp. xiii + 252.

Aristote et L'Idéalisme Platonicien. CHARLES WERNER. Paris: Alcan, 1910. Pp. xii + 371.

Emile Boutroux. PAUL ARCHAMBOUET. Paris: Louis Michaud, 1910. Pp. 217. 2 fr.

Cabanis. GEORGE POYER. Paris: Louis Michaud, 1910. Pp. 222. 2 fr.

Aliénés et Anormaux. J. ROUBINOVITCH. Paris: Alcan, 1910. Pp. 320.

Henri Poincaré. TOULOUSE. Paris: Flammarion, 1910. Pp. 204. 3 fr. 50.

L'Éducation des Anormaux. JEAN PHILLIPPE ET PAUL-BONCOUR. Paris: Alcan, 1910. Pp. 213. 2 fr. 50.

Les Images. E. PEILLAUBE. Paris: Rivière, 1910. Pp. 513. 9 fr. 323

NOTES AND NEWS.

WILLIAM JAMES, professor emeritus of philosophy in Harvard University, died August 26 of heart disease at his summer home at Chocorua, N. H. Professor James was born in New York, January 11, 1842, and from his thirtieth year was a member of the Harvard faculty. Beginning in 1872 as instructor in the department of comparative anatomy and physiology, he was made assistant professor of philosophy in 1880, professor of philosophy in 1885, professor of psychology in 1889 and again professor of philosophy in 1897. In 1907 he retired from active service in order to devote himself to philosophical writing. He was Gifford lecturer at Edinburgh for the two years 1889-1901. As one of his latest honors he was this year elected foreign associate of the French Academy of Moral and Political Sciences.

AN international congress has been called "for the study of all phenomena occurring in living beings or through their agency, which appear incapable of complete explanation by laws and forces of nature already known." The meetings will be held in Paris during November. The official title is 'Congrès international de psychologie expérimentale'; the aims would have been less open to misinterpretation had the name Congress for Psychical Research been adopted. We trust the change may yet be made.

DR. MABEL CLARE WILLIAMS has been advanced from an instructorship to an assistant professorship of psychology in the State University of Iowa.

DR. KNIGHT DUNLAP has been advanced to an associateship in psychology at the Johns Hopkins University.

THE August number of the *BULLETIN*, dealing especially with Comparative Psychology, was prepared under the editorial care of Professor Margaret Floy Washburn.

THE following item is taken from the press:

DR. J. E. W. WALLIN, of the New Jersey Training School, has accepted the position of director of the newly-established laboratory of clinical psychology in the New Jersey village for epileptics at Skillman.

